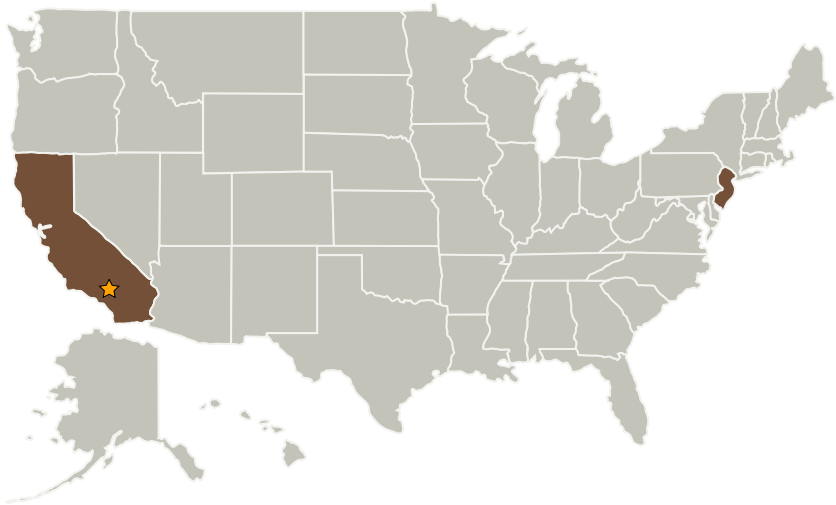
HALE Modeling Tools for Real Time Hardware-Coupled Aeroservoelastic Simulations, Phase I

Completed Technology Project (2006 - 2006)

Project Introduction

Ongoing work under NASA sponsorship is defining promising High Altitude Long Endurance (HALE) demonstration vehicle designs for remote sensing, communication relay, environmental monitoring, and other critical missions. Continuing challenges in preparing these vehicles for flight test include issues that will also be critical in the development of operational HALE vehicles: time-accurate simulation of aeroelastic effects; simulation-based design of flight control and propulsion systems for high efficiency, structural stability, and adequate control at all flight conditions; and effective, validated, full-vehicle dynamics analyses for aeroservoelastic applications. The proposed effort will address these needs by making available modular, state of the art modeling tools for use in full aircraft simulations to support vehicle assessment and control system design throughout the HALE flight test and development process. These tools will be operable in a range of modes with up to real-time turnaround and will feature a unique ability to support hardware-coupled ("hardware in the loop") simulation in conjunction with finite element-based aeroelastic modeling. This capability will support both near term flight demonstrations of prospective HALE vehicles and long-term design and analysis tasks for NASA HALE platforms.

Primary U.S. Work Locations and Key Partners



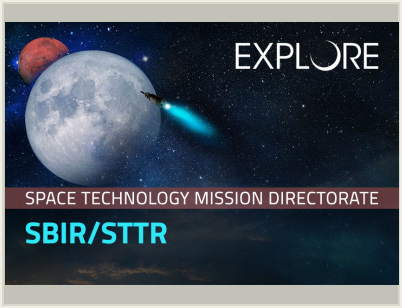


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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Armstrong Flight Research Center (AFRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Armstrong Flight Research Center(AFRC)	Lead Organization	NASA Center	Edwards, California
Continuum Dynamics, Inc.	Supporting Organization	Industry	Ewing, New Jersey

Primary U.S. Work Locations	
California	New Jersey

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX15 Flight Vehicle Systems
  - TX15.1 Aerosciences
    - TX15.1.3 Aeroelasticity